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Between 1955 and 1967, a Merovingian cemetery was excavated at the village of Beerlegem, in the Belgian province of Eastern-Flanders. Out of the 255 graves already some fifty had been destroyed due to the activities of a sand quarry, while others had been looted.

Grave 111, rich, undisturbed and contained in a burial chamber, is known as that of "The Lady of Beerlegem." A dendrochronological analysis of two planks from the bottom of the burial chamber, carried out by E. Hollstein from the "Rheinisches Landesmuseum" at Trier, has dated the felling of the tree to around 587 A.D.

Another important chronological feature is a golden finger ring of the Naroda-type. These finger rings, imports from Byzantium or imitations of Byzantine models, mainly occur in late 6th century contexts, and rather sporadically in graves from the early 7th century. This chronological feature is in accordance with the other grave goods.

Thus the burial of the woman from grave 111 has to be dated to around A.D. 587-590/600.

A description of the graves and a study of the grave gifts and the textiles have already been published [Roosens 1959: 138-150; Lefève 1959: 152-156].

The grave of the lady of Beerlegem is one of the most important of the whole cemetery. It is exceptional because the woman was buried in a wooden burial chamber 3.70m long by 2.30m wide and at least 1.35 m high. The coffin was placed on 2 crossbeams and was, according to the traces left in the soil, 3 m long by 0.90 m wide and 0.40 m high, laid out on a Southwest to Northeast axis, with the head to the Southwest.

Not only the burial chamber but also the grave gifts testify to the high status and wealth of the lady.

Because of the acidic conditions in the grave, the skeleton was completely decomposed but the hair and even a lot of textile fragments were well preserved [Lefève 1959: 152].

Description of the grave contents

At the feet, a bell-shaped glass beaker and a globular glass bowl with thread decoration, a wheel-thrown biconical bowl with two bands of rouletting on the shoulder and fragments of a bronze vessel were found together with textile fragments. According to the archaeologist Roosens [1959: 142], these gifts were probably on top of this textile, a weft-faced tabby structure with napped surface.

The golden finger ring of the Narona-type, fragments of a knife with a golden handle cap, a silver chain and a perforated ornamental bronze plate, 8.3 cm in diameter, covered by layers of felted cloth, were found at the left side of the body. Roosens [1959:142] remarks that this felted cloth could come from a mantle.

A heavy fabric was situated near the knees. This turned out to be a weft faced compound tabby or taqueté.

140 amber and glass beads were found in the grave, dispersed over the body from knees to chest. According to Roosens [1959: 142], the situation of these beads in the grave indicates that they did not come from a necklace, but rather served as decoration on a garment. In some fragments of a well balanced diamond twill, small holes can still be seen, the remnants of stitches.

The textiles

From the date of their excavation up to 2000 no conservation work at all was carried out on these textiles. Part of the textiles were found to be in single layers, but several fragments were stuck together in 5 to 10 layers.

In the year 2000 the textiles were soaked in demineralised water without a detergent, in order to avoid too much rinsing of the fragile fibres. The different layers were gently separated with tweezers. The textiles were dried with tissue paper.

Seven different types of textiles were found in grave 111 and are now stored in 23 plastic boxes, mostly mixed up. Seven boxes have the old label which refers to the location of the fragment within the grave.

The fibres were analysed by microscopic analysis. The surface of the fibres is strongly eroded and no

Table 1. List of textiles of grave 111, Beerlegem.

Weave	Spun	Threads/cm	Diameter (mm)
	Warp weft	Warp weft	Warp weft
Napped tabby	Z2S * Z*	10-12 14	0.3 0.5-0.7
Cloth (or Felt?)	Z*	-	-
Tabby	Z Z	7 7	0.4 0.4
Tabby	Z Z	14 14	0.25 0.25
Taqueté	Z2S* 2Z*/°	6 20	0.4 0.5
Tabby;	Z S	16 7	0.5 0.5
Floats	Z2S*/°-Z		0.5
Diamond Twill	Z S	15 14	0.3-0.4
Embroidery	Z2S*/°		

scales could be detected. More information was needed, and amino acid and dye analyses were performed at the Royal Institute of Cultural Heritage, Brussels by Ina Vanden Berghe.

Eight samples from five fabrics (marked with * in the list of textiles: Table 1) were taken for fibre analysis and all of them are animal fibres, of which 6 are of a hairy type. Most threads are composed of fibres of varying thickness (10 to 55μm) and the amino acid analyses point to the hair of horse, goat or even pig. The weft of the napped tabby has fibres with segmented medulla as found in fur. Only one, a sample of felted cloth with a high oxidative degradation, clearly corresponds to wool. Further study is needed.

In 1959 no dyestuffs were found [Lefève 1959: 156] but now, in 2002, the more sensitive HPLC technique (High Performance Liquid Chromatography) was used. Four samples (marked with ° in the list of textiles: Table 1) were specially selected for analysis. On the sample taken from the embroidery of the diamond twill fabric, traces of tannin were found. The dark weft of the taqueté fabric shows traces of alizarin, a dye component of Rubiaceae plants (e.g. madder and madder-like plants from bedstraw). No dyestuff could be detected on two samples of the dark pattern floats on the tabby. The lack of dyes in these textiles corresponds with results published by Walton Rogers [1997: 393] on the raw materials of textiles from Northern Germany and the Netherlands.

Most of the textiles (Table 1) have Z- spun or Z2S ply threads in both directions, except the tabby weave with float decoration and the diamond twill both with the weft in S-spun.

The diameter of the threads varied from 0.25 mm of the medium to fine quality tabby weave to a coarser weft thread of 0.5 to 0.7 mm used in the napped tabby fabric.

1 – The fabric of weft-faced tabby, found under the grave gifts, has a warp of fine Z2S plied threads of mixed colour of a natural pigmented wool, 10 to 12 ends per cm. The weft, of a pale brown colour, is thicker than the warp threads, is very well twisted together in a Z- direction and completely covers the warp with 14 picks per cm. This textile is remarkable for the use in the weft of fibres resembling fur. The surface was napped as can be seen in some fragments. The fragments are now divided over at least 5 boxes, sometimes together with fragments of other fabrics. Some pieces have a dimension of 9 to 11cm. Two of them have a seam, but no other signs that this fabric had been made into a garment were found. We accept

Fig. 1. Textile 5: weft-faced compound tabby.

the opinion of Roosens [1959: 142] that this fabric could come from a mantle.

This napped tabby fabric can be compared to the, as yet undated, so-called swaddling-cloth, one of the relics in Aachen Cathedral [Verhecken-Lammens, De Jonghe 1996: 20]. It can also be compared to mantles and leggings excavated in Antinoë, dated to between the end of the 3rd century to about A.D. 600, which are considered to be Iranian products [Benazeth, Dal-Pra 1993: 367, 382]. In contrast to the Z-spun ends in the other fabrics the warp threads of the fabric in grave 111 are plied Z2S.

2 – A number of felted cloth fragments are now stored in different boxes. The largest are approximately

Fig. 2. Textile 6: tabby with supplementary pattern weft floats.

3 to 4 cm by 2 cm. This compact fabric, with a disturbed pile surface, has no visible weave structure. Only in some fragments, threads of Z- spun can be dletected. At first sight the fabric seems to be felt, but because of some visible twisted threads, the possibility that the textile was woven, fulled, napped and probably sheared, must be considered. The fibres of this fabric, in its current condition, are so weak that they are falling apart in "fibrils" and the amino acid analysis reveals a greater similarity to wool than that of the fibres of the other fabrics of this grave.

3 – A small textile fragment woven in an open tabby structure is stored together with a small bronze disk. The disk, 1.5 cm in diameter, was found together perforated ornamental bronze disk. The latter was of a type which used to be sewn on small bags [Bartel, Ebhardt-Beinhorn 2001: 179-230]. Is it possible that this textile fragment was part of a bag? Perhaps part of the lining? The fabric has a warp and weft count of 7 Z- spun threads per cm.

4 – Another textile fragment was found near the silver chain. This well-balanced tabby fabric of medium to fine quality has 18 Z- spun threads in both directions.

5 – The weft faced compound tabby (Fig. 1), also called "taqueté" is exceptional in this context. Fragments, some of them with a dimension of 8 by 9cm, are present in 9 of the boxes. The fabric has a Z2S plied wool warp of 6 ends per cm. Most of these warp threads have disappeared but holes formed by the weft can clearly be seen. The warp is divided in 2 systems with the proportion between main warp and binding warp of 1/1. The weft consists of paired Z-spun threads, which completely concealed the warp with 20 picks per cm or 10 weft units of 2 picks. It is impossible to find out if this fabric had a colour pattern. The weft doesn't seem to change from front to back as we see in patterned taqueté, although weft stripes in paler and darker threads could be possible, as some pieces still have a dark bronze colour and the dye analysis shows traces of alizarin. No seams are found on the fragments of this heavy textile, which may have been used as a coverlet.

Weft faced compound tabby fabrics in wool are very rare in Merovingian graves. Even in general textile collections, woollen taqueté fabrics with Z2S plied warp threads and 1/1 proportion are hard to find, although we know of two pieces: one in the Abbegg-Stiftung collection, Riggisberg, Switzerland (inv. nr. 1640) and one in the Victoria and Albert Museum collection, London (inv. nr. T 223-1957). Compared to this Merovingian fabric, these fabrics have a design, a finer structure with single Z-spun wefts and higher thread count.

6 – A few small fragments of a patterned fabric (Fig. 2) were found near the legs.

This warp faced tabby weave has 16 Z- spun warp threads per cm. The weft has S- spun threads and 7 picks per cm. Floats of supplementary wefts form the pattern. These floats are over 5 and under 5 warp threads or over 9 and under 11 warp threads. The proportion between ground weft and pattern weft is 1/1, and every pattern shed has been repeated 3 times, creating a geometrical design (Fig. 3a). Different shaded threads form the pattern: dark brown Z2S plied threads and paler Z- spun threads on which no dyestuff could be detected.

This type of textile resembles ribbons sewn on Coptic tunics and it would not be surprising if this textile had been used for the same purpose.

7 – The last type of textile is a medium to fine diamond twill, common in Merovingian graves. The fragments are stored in 8 boxes. An old label mentions: "not specified" as location in the grave. This dark brown fabric has 15 Z- spun warp threads per cm. The weft has S- spun threads and 14 picks per cm. The diamond twill has a repeat of 12 threads in warp direction and 18 in weft direction (Fig. 3b). One fragment, 9 by 5 cm, clearly shows an embroidered design (Fig 4). The other fragments are too small or in too bad a condition for a reconstruction of the design.

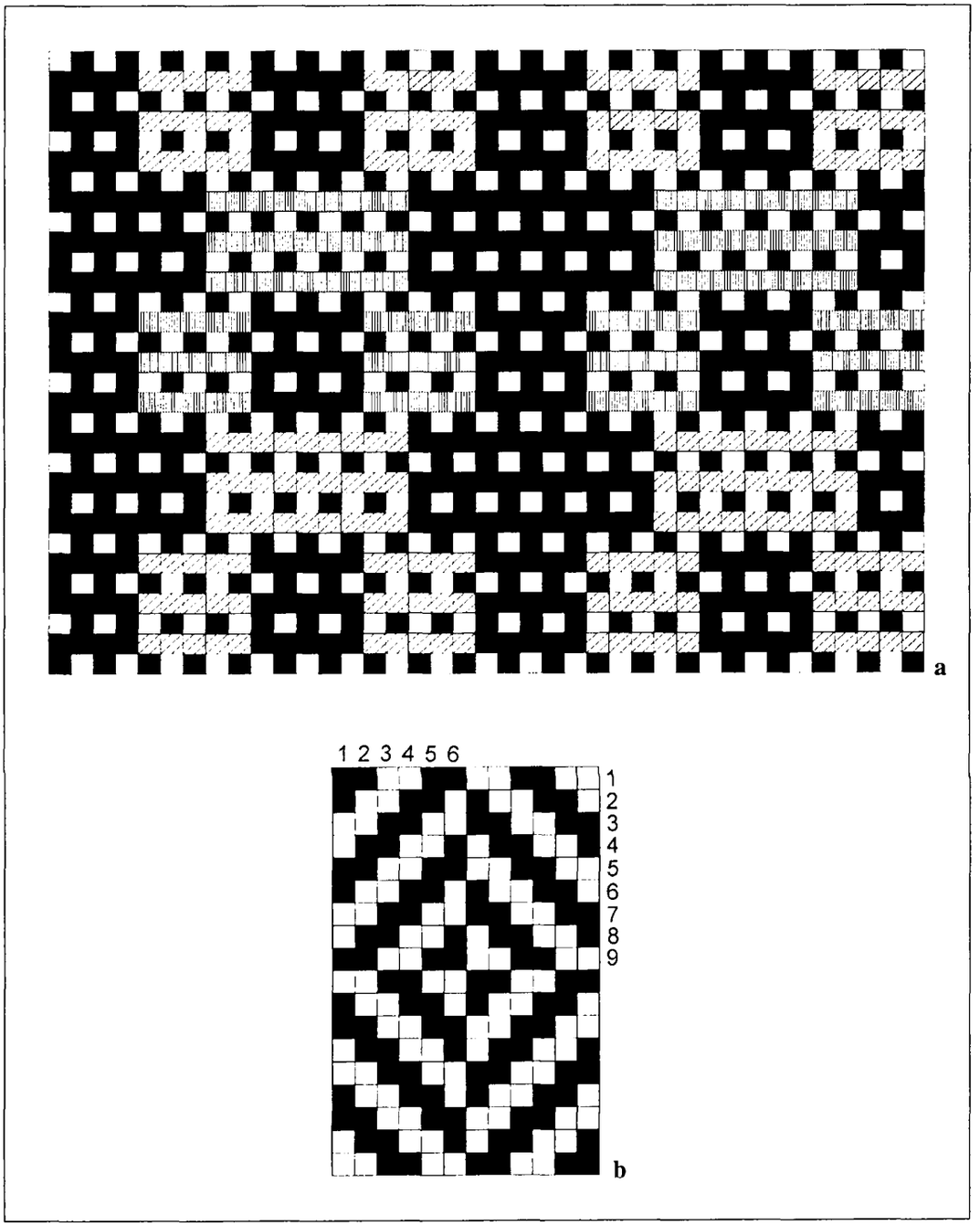

Fig. 3. Structure of textiles: a, textile 6; b, textile 7.

The embroidery is worked in chain stitches 0.4 cm long with Z2S plied pale brown threads which stand out from the darker background. In some poorly preserved fragments these plied threads are the only indication they belong to this diamond twill fabric. The dye analysis of the embroidery threads shows only traces of tannins.

In some fragments small holes can be seen, but it is not possible to say if they are caused by embroidery or by the type of bead decoration already mentioned in the description of the grave contents.

A very small fragment shows something special. On the edge of this fragment we can see countered weft twining and the dark brown plied thread seems to be a sewing thread. We hesitate to decide if we are dealing with a starting border as often seen in Coptic textiles.

Summary

This undisturbed grave of a wealthy woman gives interesting information about different types and

Fig. 4. Textile 7: embroidery on diamond twill fabric.

qualities of textiles at the end of the sixth century in Flanders. In this region, it is very unusual to find remnants of textiles, except in the form of pseudomorphs attached to a metal object [Verhecken-Lammens, NESAT 7]. However in the nearby village of Velzeke Z-spun linen textile fragments were found together with a Roman hoard containing 184 silver coins, dated between A.D. 260 and 269 [De Moor 2000: 28]. Thanks to the special conditions in grave 111, textiles made of animal fibres have survived. There are no traces of linen fabrics, although we may suspect that some of the undergarments had been of linen. We may assume that the acid condition of the grave probably decomposed both skeleton and linen.

The range of 7 different types of textile in one grave testifies again to the status of the woman. It also bears witness to a high level of textile manufacturing in that period, though not necessarily of local production [see also Mannering 1997: 135-136]

In this period in Europe Z/Z tabby weave and Z/S diamond twill are very common (Bender Jørgensen 1991: 141, 143)

The Z/S tabby with supplementary pattern floats in Z- spun and Z2S-ply threads has been interpreted as an Alamannic or Bavarian cloth-type by Bender Jørgensen [1991: 145]. It seems to be a new type of cloth for that period.

The presence of a fulled, napped cloth is a surprise. It's only because Z-spun threads were found in the fragments that we consider the possibility of cloth instead of felt. The different stages of production required to make woollen felted cloth were already known by the Romans and were well established in the large towns of the northern provinces [Wild 1970: 82-84; Forbes 1987: 90-93].

The napped tabby weave seems to be an imported product, although we still have some doubts on this point. The fabric in Aachen (see textiles, 1) could be regarded as an import from the East because of the special assignment of this textile as a relic. All other relics from Aachen are, however, most probably European products. What about the textile in grave 111? Is it an import from the East or a European product ? The spin direction corresponds to the common North European tradition of Z-spin and Z2S ply. The fine short fibres with a medulla, resembling fur, could have originated from European animals. Napping fabrics was already known from Roman times. All these arguments point to the possibility of a European product.

These arguments also apply to the weft-faced compound tabby. This fabric is unusual in Merovingian graves but it is interesting to know that it existed in this region. A simple loom can be used to weave this type of plain compound fabric.

We now have an idea of the variety of textiles used for clothing in this region. Unfortunately the fragments are too small to give further information about the construction and cutt of the lady's wardrobe.

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